## REMARKS

Favorable reconsideration of this application in view of the foregoing amendments and remarks to follow is respectfully requested. Since the present amendment raises no new issues, and in any event, places the application in better condition for consideration on appeal, entry thereof is respectfully requested.

In the outstanding Office Action, the Examiner has indicated that the Information Disclosure Statement filed on February 14, 2007 was improper. Applicants observe that in the Supplemental Response under 37 C.F.R. § 1.105 dated February 14, 2007, the applicants listed the H. Ishida et al. article on page 2. The applicants however forgot to attach a separate sheet including the listing of the H. Ishida et al. reference and a place on the separate sheet for the Examiner to initialize and date. To rectify this apparent oversight, and to make the H. Ishida et al. of record, applicants attached herewith a proper form that separately lists the H. Ishida et al. article and includes a place in which the Examiner can initialize and date the consideration of the same.

In addition to the above, the Examiner objects to the drawings for not showing every feature recited in previous Claim 1. Specifically, the drawings were objected to since the claimed feature of " a first layer of silicon nitride entirely on said terminal layer" was allegedly not shown in the drawings of the instant application. In addition to the drawing objection, the Examiner has indicated that the originally filed specification is objected to as well since the same allegedly does not include a sufficient disclosure of the term "terminal layer".

In view of the above, applicants have amended Claim 1 to positively recite the structure shown in FIG. 2 of the present application. Specifically, Claim 1 has been amended to positively recite the presence of a layered substrate for transferring, said layered substrate including a

semiconductor substrate, a device layer located directly on an upper surface of said semiconductor substrate, and an interconnect layer including at least one metallic component embedded with a dielectric material abutting an upper surface of said device layer.

Applicants have also amended Claim 1 to positively recite the presence of a bi-layer capping coating on top of the layered substrate, each layer of said coating provides adhesion and protection, said bi-layer capping coating comprising a first layer of silicon nitride abutting an upper surface of said interconnect layer, said first layer of silicon nitride is non-patterned and a second layer of an amino silane atop said first layer of silicon nitride, said layer of silicon nitride caps said at least one metallic component.

Support for the above amendments to Claim 1 is found in FIG. 2 of the originally filed application as well as paragraphs 0047, 0053 and 0054.

In addition to the above amendments to Claim 1, applicants have also made minor amendments to Claims 8 and 9 (required for antecedent basis), and have cancelled previously withdrawn Claims 19-32.

Applicants respectfully submit that the above amendments to the claims obviate the objections to the drawings and specification raised in the outstanding Office Action. As such, reconsideration and withdrawal of the objections to the drawings and specification are respectfully requested.

Applicants observe that the majority of the amendments performed on Claim 1 were required to obviate the aforementioned objections to the drawings and specification. The amendment that added the feature that the silicon nitride layer is non-patterned was added to clarify the present invention. This feature is evident in FIG. 2.

Since the above amendments to the claims do not introduce any new matter into the originally filed specification, entry thereof is respectfully requested.

In the outstanding Office Action, the Examiner rejected Claims 1-6, 8-11, and 13-18 under 35 U.S.C. §103(a) as allegedly obvious over the combination of Applicants' admitted prior art (hereinafter "AAPA") and U.S. Patent No. 5,287,003 to Van Andel et al. (hereinafter "Van Andel") or European Patent Application No. 251347 to Ponjée et al. (hereinafter "Ponjée"). Specifically, the Examiner asserted that the AAPA discloses all the limitations recited by Claims 1-6, 8-11, and 13-18 except a bi-layer capping coating comprising a first layer of silicon nitride and a second layer of amino silane, that Van Andel and Ponjée both disclose a bi-layer capping coating layer comprising a first layer of silicon nitride and a second layer of amino silane, and that it would therefore be obvious to use the bi-layer capping coating disclosed by Van Andel and Ponjée in the structure disclosed by the AAPA to yield Applicants' claimed invention.

Applicants respectfully traverse the Examiner's claim rejections, for the following reasons.

First, and with respect to AAPA, applicants observe that in the originally filed specification it was admitted that the structure shown in FIG. 1 was known in the prior art. In accordance with paragraph 0051 it was admitted by the applicants that the prior art structure "consists of: a layered structure-to-be-transferred 100, which includes bulk silicon 101 and a device layer 102 terminated by the Cu patterned wiring level 103; capping layer 200; sacrificial polyimide layer 300; adhesion layer 400; and glass carrier 500. In such a structure, only an amino silane … is used as the capping layer 200. " Emphasis added by the undersigned.

Applicants opine that in describing the APPA structure, the applicants used the language "consists of" to indicate that the prior art structure including only the elements recited. Hence,

the Examiner allegation that the applicants admitted that the prior art structure includes first and second silane layers is not correct. Moreover, as is evident by FIG. 1, capping layer 200 includes an upper surface that is in contact with the sacrificial polyimide layer 300, and a lower surface that is in contact with the Cu patterned wiring level 103. Applicants find no disclosure whatsoever of the presence of a first silane capping layer and a second silane capping layer as alleged by the Examiner. If the applicants intended to show two different silane layers in the prior art structure they certainly would have done so.

Applicants observe that in the application, the silane that was said to be a few monolayers thick is represented as a single layer, since no composition with change occurs during the formation of the silane layer. Applicants observe that one skilled in the art normally does not drawn separate layers when the composition of the deposited layer does not change as is the case of the monolayer silane coverage. Applicants further observe that the specification at paragraph 0051 never indicated that the capping layer 200 was "a capping layer" as indicated by the Examiner.

Applicants submit that the APPA provides a single amino silane as a capping layer which serves as an adhesion promoter for patterned Cu-containing interconnect structures enabling increased strength in the Cu-polyimide and dielectric-polyimide interfaces. The single amino silane capping layer also serves as a Cu diffusion barrier in the APPA structure.

Applicants observe that in APPA the capping layer is a single layer comprised of an amino silane and no other material layer is reported to be present in the capping layer of the APPA.

The applied secondary references of Van Andel et al. and Ponjée et al. do not alleviate the above defects in AAPA since the applied secondary reference are concerned with chip

packaging and wiring bonding which occurs after the formation of the interconnect structures in a semiconductor chip. As such, one skilled in the art would not consider that the silicon nitride and amino silane bilayer disclosed in Van Andel et al. and Ponjée et al. for use in packing and wiring bonding could be used in an interconnect structure. Applicants observe in this regard that in the applied references the layered structures do not discloses an interconnect layer including at least one metallic component embedded with an insulating material, a layer of silicon nitride located on un upper surface of the interconnect layer, and an amino silane layer located on said layer of silicon nitride, wherein said layer of silicon nitride caps said at least one metallic component.

Applicants observe that in Van Andel et al. the silicon nitride 20 is a passivation layer to oxide layer 17. The silicon nitride layer is patterned exposing a surface of Al bond pad 18 and as such, the silicon nitride layer does not serve as a capping layer for Al bond pad 18.

Applicants observe that Ponjée et al. also does not teach or suggest an interconnect layer having at least one metallic component embedded within an insulating material, wherein a layer silicon nitride is present on the interconnect layer and an amino silane layer is located on the layer of silicon nitride. In contrast, Ponjée et al. discloses a packing structure including a bond pad 2 located on a surface of a semiconductor device. A silcon nitride layer 3, a bonding agent 6 and a patterned polyimide layer 4 are located thereon. The patterned polyimide layer has openings 5 above the bond pads and in a subsequent etching step underlying bonding agent, and silicon nitride layer are removed exposing a surface of the bond pads. As such, Ponjée et al. does not disclose that the silicon nitride layer serves as a capping layer to the metallic component, as presently claimed.

Moreover, it has been well established that if the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the modification or combination is inappropriate and cannot be used to support a *prima facie* case of obviousness. *In re Ratti,* 270 F.2d 810, 123 USPQ 349 (CCPA 1959).

In this case, the Van Andel reference is related to a semiconductor chip 10 that comprises aluminum bonding pads 18 that are electrically connected to the lead frame 14 by metal wires 15 (see Van Andel, Figs. 1 and 2, column 2, lines 34-35 and column 4, lines 45-47). The electrical connection between the aluminum bonding pads 18 and the metal wires 15 is ensured by the presence of the apertures in the silicon nitride layer 20 at locations over the bonding pads 18, through which the aluminum bonding pads 18 and the metal wires 15 can directly contact each other and therefore be electrically connected with each other.

However, if the silicon nitride layer 20 capped the aluminum bonding pads 18, as suggested by the Examiner, the aluminum bonding pads 18 and the metal wires 15 would become electrically isolated by the silicon nitride layer 20 and would no longer be electrically connected to each other. Consequently, the semiconductor chip 10 would no longer be electrically connected to the lead frame 14.

Therefore, the proposed modification of the Van Andel reference or combination thereof with the AAPA, as suggested by the Examiner, would change the principle of operation of the Van Andel invention. The proposed modification or combination is thus inappropriate and cannot be used to support a *prima facie* case of obviousness.

The Ponjée reference discloses a semiconductor device 1 having terminal contact pads 2 and a bi-layer coating that comprises a silicon nitride layer 3 and an bonding agent layer 6 formed of an amino silane (see Van Andel, FIG. 1, column 3, lines 10-11, and lines 35-50).

Similar to Van Andel, the Ponjée reference also discloses that it is desirable to make electrical connections with the contact pads 2 on the semiconductor device 1, and that in order to manufacture electrically connections with the contact pads 2, apertures 5 are formed in the overlaying polyamide layer 4, and the silicon nitride layer 3 is removed locally by a suitable etching treatment (see Ponjée, column 1, lines 30-32, column 2, lines 16-18, and column 4, lines 14-19). Therefore, it is clear that the silicon nitride layer 3 in the final structure of Ponjée is also present as a cap on the contact pads 2, by rather contains apertures through which electrical connections can be made to the contact pads 2.

In the outstanding Office Action, the Examiner also asserted that the proposed substitution of the amino silane layer 200 of the AAPA with the bi-layer coating of Ponjée would provide a first layer of silicon nitride entirely on a terminal layer that includes at least one metallic component.

However, if the silicon nitride layer 3 of Ponjée was not locally removed to form apertures therein but was allowed to extend entirely on the contact pads 2 in the final structure of Ponjée, as suggested by the Examiner, no electrical connections could be made to the contact pads 2, and the semiconductor device 1 of Ponjée would become completely isolated.

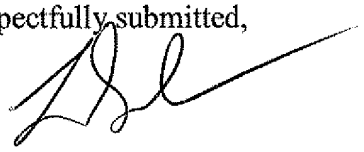
Therefore, the proposed modification of the Ponjée reference or combination thereof with the AAPA, as suggested by the Examiner, would change the principle of operation of the Ponjée invention. Such a proposed modification or combination is thus inappropriate and cannot be used to support a *prima facie* case of obviousness.

In summary, the proposed modification of the Van Andel and Ponjée references or combination thereof with the AAPA cannot be used to support the § 103 rejections against Claims 1-6, 8-11, and 13-18 of the present application. Correspondingly, Applicants hereby

request the Examiner to withdraw the § 103 rejections and to issue a Notice of Allowance in Applicants' favor.

If any issues remain outstanding, incident to the formal allowance of the application, the Examiner is requested to contact the undersigned attorney at (516) 742-4343 to discuss same, in order that this application may be allowed and passed to issue at an early date.

Respectfully submitted,



Leslie S. Szivos, Ph.D.
Registration No. 39,394

SCULLY, SCOTT, MURPHY & PRESSER, P.C.
400 Garden City Plaza - Suite 300
Garden City, New York 11530
(516) 742-4343
LSS:vh